EXHIBIT 2

THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION

TQ DELTA, LLC, *Plaintiff*, v. COMMSCOPE HOLDING COMPANY, INC., COMMSCOPE INC., ARRIS US HOLDINGS, INC., ARRIS SOLUTIONS, INC., ARRIS TECHNOLOGY, INC., and ARRIS ENTERPRISES, LLC, *Defendants*.	Civil Action No. 2:21-CV-310-JRG
TQ DELTA, LLC, *Plaintiff*, v. NOKIA CORP., NOKIA SOLUTIONS AND NETWORKS OY, and NOKIA OF AMERICA CORP., *Defendants*.	Civil Action No. 2:21-CV-309-JRG

EXPERT REBUTTAL REPORT OF ARTHUR BRODY, PH.D., REGARDING VALIDITY OF THE FAMILY 1 PATENT

TABLE OF CONTENTS

> According, a person having ordinary skill would understand that this command is the claimed "initiate diagnostic mode message." And, as explained above with respect to the preamble, a person having ordinary skill in the art would also understand that the ATU-C must execute instructions in order to send this command.

Cimini Report at ¶¶219-222.

148. Thus, it appears that Dr. Cimini is relying on the command *transmitted* by the ATU-C to the ATU-R using EOC messaging protocol as the "initiate diagnostic mode message."

149. As of the last release of G.992.1 (Amendment 1), dated March 2003 and still in effect (*see* https://www.itu.int/rec/T-REC-G.992.1-200303-I!Amd1/en), and as of the last release of G.992.2 (Amendment 1), dated March 2003 and still in effect (*see* https://www.itu.int/rec/T-REC-G.992.2-200303-I!Amd1/en), quiet line noise and idle channel noise measurements were still not implemented. These measurements were not implemented until the initial release of G.992.3 (*see* TQD_TX00203780), dated June 2002, at least two and a half years after the latest possible priority date of '686 Patent, January 8, 2001.

150. Based on the above, it is my opinion that FI-071 in view of G.992.1 does not disclose or render obvious claim element 36[a] of the '686 Patent.

3. 36[b] – instructions that when executed transmit from the transceiver a diagnostic message using multicarrier modulation with DMT symbols that are mapped to one bit of the diagnostic message

151. It is my opinion that FI-071 in view of G.992.1 does not disclose or render obvious claim limitations 36[b] of the '686 Patent. First, Dr. Cimini never describes how either the FI 071 or G.992.1 references meet the Court's claim construction for the term "transceiver."

152. Second, neither FI-071 nor G.992.1 disclose modulation with DMT symbols that are mapped to one bit of the diagnostic message. Dr. Cimini opines that FI-071 "discloses instructions that when executed transmit from the transceiver a diagnostic message using multicarrier modulation" and "transmit the diagnostic message using multicarrier modulation with DMT symbols that are mapped to one bit of the diagnostic message." Cimini Report at ¶225. As discussed above, FI-071 communicates via standardized messages and these EOC messages are not modulated with DMT symbols that are mapped to one bit of the diagnostic message. Multiple EOC bits are transmitted in each frame or DMT symbol. *Supra* §XIII.A.3.

153. Dr. Cimini then states that "G.992.1 discloses transmitting from the transceiver a message using multicarrier modulation with DMT symbols that are mapped to one bit of the message" Cimini Report at ¶226. As alleged evidence supporting this statement, in paragraphs 227 through 233, Dr. Cimini points to the use of C-RATES1, R-RATES1, R-REVERB1, R-SEGUE1, R-CRC1, R-MSG1 and R-CRC2, hereinafter referenced as "the above symbols." Dr. Cimini is incorrect. As Dr. Cimini tacitly admits by not including the term "diagnostic message" above, none of the above symbols are used to send a diagnostic message.

154. Dr. Cimini then states that:

> It would have been obvious to a person having ordinary skill in the art to use the one-bit-per-symbol signaling technique of G.992.1 to convey the "standardized messages" described in FI-071. As I have explained, it was well known in the art that sending one bit per symbol was "the most robust modulation available" in ADSL, (NF-026R2 at 2), and that such a scheme would be particularly helpful on noisy lines, such as those suffering from "crosstalk and FRI ingress troubles" as FI-071 describes. Thus, a person having ordinary skill in the art would have been motivated to transmit the diagnostic messages of FI-071, which would include at least the measured quiet line PSD and measured line balance, by encoding each zero bit to one symbol of R-REVERB1 and each one bit to one

> symbol of R-SEGUE1 as described in G.992.1.

Cimini Report at ¶234.

155. Dr. Cimini relies on the POSITA to use the one-bit-per-symbol signaling technique of G.992.1 to transmit a diagnostic message. I disagree that a POSITA would be motivated "to use the one-bit-per-symbol signaling technique of G.992.1 to convey the 'standardized messages' described in FI-071." As I previously explained, FI-071 provides that:

> Upon request of a management entity, the ATU at each end of the line should be able to measure line balance and convey this measurement to the far end of the line via standardized messages. It is preferred that the line balance measurement be performed without disrupting service.

FI-071 at COMMSCOPE000402.

156. Using the "the one-bit-per-symbol signaling technique of G.992.1" would also disrupt the service. Accordingly, a POSITA would be dissuaded from modifying FI-071 as proposed by Dr. Cimini. Also, as explained previously, the standardized messages referenced in FI-071 would have been understood as the EOC messages used to communicate SNR margin and attenuation. The EOC messaging does not use "the one-bit-per-symbol signaling technique of G.992.1." *Supra* §XIII.A.3. To the extent, a POSITA was motivated to modify FI-071, they would have modified FI-071 to use the existing EOC messaging framework of G.992.1. Otherwise, using different messaging would necessitate a change in the method of operation of G.992.1.

157. Based on the above, it is my opinion that FI-071 in view of G.992.1 does not disclose or render obvious claim element 36[b] of the '686 Patent.

XV. CONCLUSIONS

258. Based on the analysis above, it is my opinion that claim 36 of the '686 Patent is valid. I summarize my analysis in the table below for the prior art references elected by the Defendants.

Claim 36	FI-071	FI-071 in view of G.992.1	Milbrandt '603 in view of T1.413-1998	Golden ATU System in view of T1.413-1998
36[Preamble]	Y			Z
36[a]	X, Y	X	X	X, Z
36[b]	X, Y	X	X	X, Z
36[c]	X, Y	X	X	X, Z
36[d]	X, Y	X	X	X, Z

X – The prior art does not meet the limitations of the claim element.
Y – The FI-071 reference is NOT prior art, and therefore does not meet the limitations of the claim element.
Z – The Golden ATU System is NOT prior art, and therefore does not meet the limitations of the claim element.

Executed on this 18th day of November 2022, in Stamford, Connecticut.

By 

DR. ARTHUR BRODY